บทความวิชาการ

บทบาทพยาบาลในการดูแลผู้สูงอายุที่มีภาวะเซพซิสขณะเข้ารับการรักษาในหอผู้ป่วยวิกฤติ

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บทคัดย่อ

ภาวะเซพซิส คือ ภาวะคุกคามต่อชีวิต ต้องได้รับการดูแลในหอผู้ป่วยวิกฤต โดยเฉพาะอย่างยิ่งในผู้สูงอายุที่มีแนวโน้มเกิดภาวะแทรกซ้อนร้ายแรง ใช้เวลาในการรักษาตัวนาน และมีอัตราการเสียชีวิตสูงเมื่อเทียบกับผู้ป่วยที่มีอายุน้อยกว่า ประกอบกับปัจจัยทางด้านกระบวนการสูงอายุ ได้แก่ ระบบภูมิคุ้มกันลดลงและระบบร่างกายมีการเสื่อมถอย และลักษณะสำคัญที่พบได้ในผู้สูงอายุคือ อาการและอาการแสดงไม่เฉพาะเจาะจง เช่น ไม่มีไข้ ภาวะสับสนเฉียบพลัน รับประทานอาหารได้ลดลง และอ่อนเพลีย เป็นต้น ส่งผลให้เกิดปัญหาสุขภาพที่ซับซ้อนและรุนแรง การคัดกรองเพื่อให้ผู้สูงอายุได้รับการรักษาอย่างถูกต้องและรวดเร็วจะสามารถช่วยลดภาวะอวัยวะในร่างกายล้มเหลวหลายระบบและอัตราการเสียชีวิต ดังนั้นพยาบาลวิกฤติต้องมีความรู้ ความเข้าใจ และความสามารถในการดูแลผู้สูงอายุที่มีภาวะเซพซิส ซึ่งต้องได้รับการดูแลจากพยาบาลที่มีความเชี่ยวชาญ เพื่อให้ได้รับการคัดกรองอย่างรวดเร็ว วินิจฉัยที่ถูกต้อง และได้รับการรักษาที่มีมาตรฐาน อีกทั้งทำให้ผู้ป่วยปลอดภัยและไม่เกิดภาวะแทรกซ้อนรุนแรง

ความสำคัญ: บทบาทพยาบาลวิกฤติ/ ภาวะเซพซิส/ ผู้สูงอายุ

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The role of nurses in caring for older adults with sepsis in the intensive care unit.

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Abstract

Sepsis is a life-threatening condition that requires care in the intensive care unit, especially in older adults who tend to have serious complications, a prolonged length of hospital stay, and a high mortality rate compared to younger patients. Along with factors related to the aging process, including the immune system weakening and the body's systems deteriorating, and important characteristics of older adults with sepsis include atypical presentations such as hypothermia, acute confusion state, loss of appetite, and malaise, resulting in complex and serious health problems. Screening sepsis to ensure older adults receive proper and timely treatment can reduce multiple organ dysfunction and mortality rates. Therefore, nurses must have the knowledge, understanding, and ability to care for older adults with sepsis while being admitted to the intensive care unit, which requires expert nursing care to achieve rapid screening, accurate diagnosis, and standard treatment to ensure patient safety without serious complications.

Keywords: The role of critical nurse/ Sepsis/ Older adults

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Introduction

Sepsis is an infection in the body caused by bacteria, viruses, fungi, or a variety of other pathogens that results in infection and induces systemic inflammatory response syndrome (SIRS), a syndrome of physiologic, pathologic, and biochemical abnormalities.[1] Sepsis is recognized as a medical emergency in which time matters and is the most common cause of admission to an intensive care unit (ICU) for older patients, which has had an increased incidence and prevalence that tends to increase with advancing age and a simultaneous increase in mortality.[2] The mortality rate of older patients with sepsis in ICU was more than twice that of adult patients, and the increase in mortality was about 0.75% per year.[2]

Sepsis is more common in older persons because of many aging-related variables, including immunosenescence, diminished physiological functions, host response declines, exacerbations of comorbidities, and the direct effect of infection on the organs.[3] Combined with multiple comorbidity such as cancer, diabetes mellitus, and chronic obstructive pulmonary disease (COPD)[4] and age-related anatomical decline. The defense mechanism of pathogens entering the body and the elimination of pathogens from the body contribute to the increased risk of sepsis in older patients[4,5], making them more susceptible to septic shock, increasing the duration of mechanical ventilation, prolonging the length of ICU stay, and a higher mortality rate of 2.5 as compared to young patients.[6] To improve the clinical outcomes of older adults with sepsis, reduce costs of care, and utilize fewer resources, accurate sepsis screening is essential for early detection and prompt implementation.[7]

However. Others factors contribute to the higher prevalence of sepsis including polypharmacy and indwelling medical devices such as urinary catheter, central line catheter, and endotracheal tube[5], these factors are modifiable. In addition, important characteristics of sepsis in older adults with sepsis is atypical presentations are unrelated to or even opposite what is expected as symptoms such as malaise or fatigue, loss of appetite, signs of dehydration, comorbidity exacerbations, and decreased activities of daily living[8], which is challenges to treating and diagnosing older adults with sepsis. Implementing preventive steps can lower the risk of sepsis.[5]

Consequently, healthcare personnel need to be aware of the risk factors for sepsis and the importance of infection control. One of the health team members is a professional nurse, who plays an important role in the health team by closely caring for patients. The objective of this academic article on the role of nurses in caring for older adults with sepsis in the intensive care unit will help nurses gain knowledge and understanding of the specifics and complexity of caring for older adults with sepsis and the prevention of sepsis by using the nursing process to assess and screen patients accurately and quickly. To keep patients safe, no serious complications occurred, and they can be safely moved out of the ICU.

Definition of sepsis

The Centers for Disease Control and Prevention (CDC) defines sepsis as the severe reaction of the body to an infection that spreads throughout your body and triggers chain reactions.[9] In addition, the World Health Organization (WHO) defines sepsis as the body's immune system's response to damage to the tissues and organs within the body.[10]

In 2016, a task force from the Society of Critical Care Medicine and the European Society of Intensive Care Medicine developed the sepsis-3 definition of sepsis and septic shock, which work best in the critical care setting[3], as follows: Sepsis was defined as life-threatening organ dysfunction caused by a dysregulated host systemic inflammatory and immune response to infection.[1] Septic shock is a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities can be clinically identified as hypotension with no apparent cause or response to inadequate volume by a vasopressor requirement to maintain a mean arterial pressure ≥ 65 mmHg and a serum lactate level > 2 mmol/L (> 18 mg/dL).[1]

In conclusion, Sepsis is defined as a serious condition that happens when the body reacts to an infection throughout your body, resulting in a dysregulated host systemic inflammatory and immune response to infection that then causes life-threatening organ dysfunction.

Pathophysiology of sepsis in older patients

Older adults have a specific characteristic of the age-related change in immune systems known as immunosenescence that decreases the immune response, both innate immunity and adaptive immunity, in T cell count and B cells, and the production of antibodies may increase the older adults' risk of infection.[4,11] The thymus gland is an extremely important organ in the creation of these various cells that are replaced with adipose tissue as age increases, resulting in a decreased response to antigens and a decrease in the production of CD4+ and CD8+ lymphocytes. A malfunctioning and reducing immune system leads to decrease the activation of interleukin-2 (IL-2), secretion and proliferation effects to activate lymphocytes. In addition, older adults appear to be in a chronic low-grade proinflammatory state, increased concentrations of interleukin-6 (IL-6), tumor necrosis factor alpha (TNF-alpha), and C-reactive protein (CRP). Moreover, age-related anatomical decline induces mechanical defense; for example, decreased thyroid function results in decreased thyroid hormones that decrease natural killer cell activity and reduce the function of the respiratory tract; decreased reserve lung capacity; reduced cough reflex to clear bacteria by expectoration; and reduced respiratory muscle endurance. This causes foreign objects to pass escape into the lungs, causing subsequent infection. Therefore, these factors contribute to increasing risk of sepsis in older adults.[4] When a pathogen enters, the body responds by building up immunity to get rid of germs and foreign substances, which involves the early activation of both pro- and anti-inflammatory responses, resulting in the immune system being stimulated by too much inflammation along with endothelial dysfunction-induced fluid to leak out of the blood vessels, causing low blood

pressure, stimulating blood clotting, and causing platelets blocked capillaries and tissue lack of blood supply, which affects the functioning of organs and leads to multiorgan failure, including kidneys, cardiovascular, gastrointestinal, and central nervous systems.[1,12]

Risk factors for sepsis in older patients

The causes and risk factors associated with sepsis in older adults include factors that can be modified such as polypharmacy and indwelling medical devices and nonmodifiable such as age, comorbidity, and reduced mobility. The various risk factors are detailed as follows.

1. Age-related change: as a result, the body's various functional systems deteriorate more. The gradual deterioration of the immune system because of aging is known as immunosenescence[4,5], with several age-related anatomical and physiological changes in the immune system. These decline the defense mechanism of pathogens entering the body and the excretion of pathogens from the body, such as the decreased function of cilia in the respiratory system that can impair the cough reflex, resulting in sputum retention in the respiratory tract and reduced bladder emptying, causing urinary tract infections, and an increased risk of falls, leading to injury and wounds with the potential to cause infections and sepsis.[1,5] Moreover, increasing age affects an elevated shock index, which indicates greater severity with sustained inadequate oxygen delivery and left ventricular dysfunction, resulting in systemic manifestations[13] with dysregulated host response, the direct effect of infection on the organ, and exacerbation of comorbidity in older adults, associated with sepsis and organ dysfunction.[3]

2. Comorbidities in older adults such as congestive heart failure, chronic kidney disease, diabetes mellitus, chronic liver failure, chronic obstructive lung disease, malignancies, and chronic infections may increase the risk of infection and also delay sepsis diagnosis.[4,5]

3. Reduced mobility: this causes decreased muscle mass, which can lead to a reduction in physiologic reserve, resulting in decreased efficiency of the immune system. Poor mobility is also associated with higher risks of developing infections and sepsis, because of poor nutritional status, pneumonia, and skin infections arising from pressure injury.[5]

4. Polypharmacy: this has many side effects, including immunosuppression and reduction in cardiopulmonary responses to infection.[5]

5. Indwelling medical devices: higher incidence of the use of indwelling medical devices in the older population, leaving the older person vulnerable to infections and sepsis.[5]

Presentations of sepsis in older patients

Atypical presentation is a crucial feature of older persons with sepsis. It is known that older patients with sepsis often have non-specific symptoms known as atypical presentations. Atypical presentation is defined as patients with no symptoms or unusual

symptoms that are unrelated to or even opposite what is expected.[14] Atypical presentations include fall, fatigue, agitation, dizziness/fainting/unconsciousness, signs of dehydration, comorbidity exacerbations, loss of appetite/reduced food intake, urine or feces incontinence, decreased walking, decreased activities of daily living.[8,12] Moreover, the atypical presentation of sepsis seems to be the cause of misdiagnosis, delay in diagnosis, and worse clinical outcome.[11]

However, some older patients still present typical presentations as well as in adult patients, including fever, tachycardia, tachypnea, hypotension, clammy skin, reduced urine output, altered consciousness level, and response to the locally infected site.[1,14] Therefore, healthcare personnel must have an in-depth knowledge of the signs and symptoms of older patients with sepsis both typical and atypical presentation to recognize potential sepsis. Noticeably, most older adults with sepsis have a higher severity of illness when admitted to intensive care, which shows symptoms and sign of organ dysfunction including tachypnea, hypoxemia, alteration of conscious, septic shock, platelet count <150,000/mm[3,13]

In addition, criteria assess signs of organ dysfunction with laboratory examination by using the Sequential Organ Failure Assessment (SOFA) score[3,15,16] as follow hypotension (mean arterial pressure < 60 mmHg), lactate level greater than 4 mmol/L, urine output <0.5 ml/kg/hr. for >2 hours, despite fluid resuscitation, ALI with PaO2/FiO2 <250 in the absence of pneumonia as an infection source, creatinine level >176 mmol/L, bilirubin >34 mmol/L, platelet count <100,000 /mm^3, coagulopathy INR >1.5.[15,16] On the other hand, some older adults may be limited in their assessment of organ dysfunction, which is likely due to a dysregulated host response and the exacerbation of comorbidities as a result of a change in SOFA score. Therefore, appropriate diagnosis for older adults should consider that clinical presentation may reflect comorbidities and the evidence of infection and acute organ dysfunctions as well.[3] Therefore, critical nurses have an important role in assessing with modern screening tools.

Role of nurse in older adults with sepsis in critical care

Nursing care-led initiatives targeting early identification and sepsis care highlight the important role that nurses play in sepsis care, which requires specific care because of geriatric syndromes and multimorbidity, which adds to the complexity of the intensive care unit.[17] Strategies for implementing Surviving Sepsis Campaign (SSC) guidelines into nursing care[15] can be divided into four main parts: assessment, initial resuscitation, control source, and palliative care, in detail as follows:

1. Prompt identification of sepsis in older adults

1.1 Monitor vital signs for temperature less than 36°C or high temperature (2°C) deviation from baseline in older adults, tachycardia (> 100 beats per minute), respiratory rate of 21–24 breaths per minute, systolic blood pressure of 91-100 mmHg, oxygen saturation less than 92%, urine output less than 0.5-1 mL/kg per hour, and new onset of altered behavior or mental state.[5]

1.2 Assess symptoms and signs of sepsis include both typical presentations such as fever, tachypnea, altered consciousness level, and response to the locally infected site and atypical presentations such as malaise, loss of appetite, dehydration, comorbidity exacerbations, fall, incontinence, and decreased activities of daily living.[5,8,12] In addition, dermatological signs in older adults with suspected sepsis include a mottled or ashen appearance, cyanosis of the skin, lips, or tongue, a non-blanching rash, and a breach of skin integrity.[5]

1.3 Assess symptoms and signs of organ dysfunction include the presence of hypotension, tachypnea, tachycardia, oliguria, clotting disorders, and hepatic abnormalities.[9,15]

1.4 Consider implementing a sepsis screening tool like the SOFA score to identify signs of organ dysfunction and mortality.[1,15,16] If there are ≥ 2 points, notify the physician for timely treatment.

2. Management for initial resuscitation in the critical phase[5,15,17]

2.1 Administration of oxygen is prescribed to achieve a target saturation greater than 94%. People with chronic lung disease should be considered, with saturations targeted at 88–92% for those at risk of hypercapnic respiratory failure[3] for prevent hypoxemic respiratory failure.

2.2 Administration of an appropriate broad-spectrum antibiotic regimen as ordered should be administered as soon as possible after recognition and within one hour for rapid control of the source infection.

2.3 Provide intravenous fluid crystalloids in an initial 500 ml bolus over less than 15 minutes to prevent complications in older adults with renal failure, heart conditions, and pulmonary edema and reevaluate encompasses clinical hydration and circulatory assessment by fluid response testing using dynamic parameters including pulse pressure variation, stroke volume variation, passive leg raising test, end-expiratory occlusion test, and mini fluid challenge test[3,15] for balanced fluid and to prevent potential harm associated with fluid overload.

2.4 Administration of a vasopressor drug after adequate fluid resuscitation targets an initial goal of MAP ≥ 65 mmHg and MAP of 80–85 mmHg in older adults with hypertension or atherosclerosis for driving pressure to peripheral blood flow and preventing organ hypoperfusion with norepinephrine as the first choice. In addition, in older adults with heart disease required close monitoring of the electrocardiogram (EKG) to reduce the complication of tachycardia and arrhythmia.

2.5 Hemodynamic monitoring continuously, hourly fluid intake and output, and nutritional status to assess physiologic status and detect complications from treatment

3. Management source control[15]

3.1 Obtain blood cultures prior to administering antibiotics and consider urine and sputum samples to identify the microorganism responsible for the disease and the site and source of sepsis.

3.2 Monitor blood levels of serum lactate to indicate tissue hypoxia and BUN,

creatinine, WBC, hemoglobin, hematocrit, platelet levels, and coagulation to indicate antibiotic toxicity.

3.3 Provide nursing care using universal precaution techniques to prevent and reduce the spread of infection, such as hand washing, effective use of personal protective equipment (PPE), and environmental cleaning regimes.[5]

3.4 Using an aseptic technique after practicing hand hygiene is necessary and using chlorhexidine gluconate 2% w/v in isopropanol 70% to clean at least 2-3 times at ports of invasive lines.[17]

4. Setting goals of care

Some older adults with sepsis have the risk of multiorgan dysfunction, long-term functional sequelae, and death; therefore, they should be integrated into palliative care based on physicians' judgments[15], depending on acute illness, baseline comorbidities, and frailty, along with the multidisciplinary team for evaluation and discussion about defining goals of care and promoting communication[11] and understanding between the patient's family and the healthcare team to decrease stress, anxiety, and depression in the patient's relatives.[15] Notably, age by itself is not a good indicator of palliative care in the intensive care unit; alternative methods for determining the severity of an illness and quantifying risk ought to be verified and applied to inform care-based choices. Furthermore, the healthcare team should avoid discussing withdrawing care early.[11]

Summary

The critical care nurse's role in caring for older adults with sepsis is important and covers screening, initial resuscitation, control of source infection, and palliative care, including coordination with interdisciplinary teams to promote optimal outcomes. When this group of patients does not receive appropriate care, it results in severe complications, prolonged hospital stays, an inability to fully recover, and mortality. As critical nurses, they must have quick thinking, decision-making skills, and knowledge to reduce the occurrence of such complications, as well as prevent and monitor complications resulting from treatment to keep patients safe and able to move back to the ward.

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